

**BASIS FOR PRELIMINARY COST ESTIMATES  
SEDIMENT REMEDIATION  
FOX RIVER, WISCONSIN  
LITTLE LAKE BUTTE DES MORTS**

**Material Handling Assumptions:**

Volume > 250 ppb	1,626,352	cy		1,241,490	m3
Volume > SWAC	1,128,565	cy		861,500	m3
Volume > 50 ppm	62,742	cy		47,895	m3
Volume > SWAC and < 50 ppm	804,852	cy		614,391	m3
Volume > SWAC Not Capped	734,256	cy		560,501	m3
Volume > 50 ppm - Cap Area	8,070	cy		6,160	m3
Solids Specific Gravity	2.5				
Fresh Water Density	62.4	lb/ft3			
In Situ Density	24.2%	w/w	13.2%	v/v	1.01 tons per cy
Horizontal Auger Slurry Density (30% in situ)	9.4%	w/w	3.9%	v/v	0.89 tons per cy
Dewatered Density	50%	w/w	28.5%	v/v	1.20 tons per cy
Treated Density	90%	w/w	84.6%	v/v	1.92 tons per cy

**Cost Estimating Parameters & Methodology:**

Interest Rate	8.0%
Sales Tax	5.5%
Engineering, Procurement and Construction Mgmt	12.0%
Contractor Overhead and Profit - Dredging Only	15.0%

Dredging

Dredge Monitoring (Water Quality)	\$800	per day
Sediment Removal QA	\$1,200	per day

Hydraulic Low Solids - 10-inch Horizontal Auger (2917 gpm)

Site Preparation	\$100,000	per dredge launch site
Mobilization - Equipment	\$250,000	per dredge
Mobilization - Silt Curtain	\$35,000	
Shift Rate (12 hours)	\$4,200	per shift
Dredge Rate	2600	cy in situ per 12 hour shift
Site Restoration	\$25,000	per dredge launch site

Hydraulic Low Solids - 6-inch Horizontal Auger (673 gpm)

Site Preparation	\$100,000	LS
Mobilization - Equipment	\$250,000	per dredge
Mobilization - Silt Curtain	\$35,000	
Shift Rate (12 hours)	\$3,000	per shift
Dredge Rate	600	cy in situ per 12 hour shift
Site Restoration	\$25,000	LS

Mechanical

Dock Construction	\$400,000	LS
Mobilization - Equipment	\$48,000	per dredge
Mobilization - Silt Curtain	\$35,000	LS
Mobilization - Watertight Barge	\$100,000	ea
Shift Rate (10 hours)	\$6,000	per shift
Dredge Rate	500	cy in situ per 10 hour shift
Offload Stockpile Area Prep.	\$75,000	per area
Barge Capacity	500	cy
Free Water per cy Dredged (10%)	20	gal
Offload Shift Rate (8 hours)	\$2,900	per shift
Upland Offloading Rate	500	cy per shift
Barge Movement Time	4	hours
Offload Crane Mobilization	\$50,000	LS
Site Restoration	\$25,000	LS

Sediment Treatment

High Temperature Thermal Desorption

Setup Staging Area	\$50,000	
Mobilization/Site Prep	\$150,000	
Sediment Treatment QA	\$2	per ton
Ratio of Amending Sand Volume to Dredge Vol.	0.25	:1
Sand Purchase and Deliver	\$6	per ton
Blending	\$25	per ton
HTTD (includes off-gas treatment)	\$75	per ton
Stack Testing	\$50,000	LS
Placement in CDF	\$2	per ton

Capping

Mobilization/Site Prep	\$100,000		
Area	6,479,673	sf	601,996 m2
Depth	0.5	feet	
Geomembrane (80 mil)	\$6	per sy	
Cobbles	\$25	per cy	
Cap Placement QA	\$100,000	LS	

Long-term O&M  
Long-term Monitoring

\$65,000 per year  
\$30,000 per year

Nearshore CDF		<u>Arrowhead</u>		<u>Menasha</u>
Land Lease or Purchase	\$1.8	per sf		\$1.8
Length	8,000	lf		9,200
Capping Volume	190,000	cy		170,000
Seeding Area	280,000	sy		250,000
Sheetpile Wall Length	8,000	lf		9,200
Sheetpile Depth	30	ft		30
Sheetpile Cost	\$19	per sf		\$19
Shot Rock Berm	\$650	per lf		\$550
Rip Rap	\$215	per lf		\$250
Place Treated Material	\$2	per cy		\$2
Clean Soil Cap	\$10	per cy		\$10
Seeding	\$1	per sy		\$1
Mitigation	\$10,000	per acre		
	\$10,000	per year		
Long-term Monitoring	\$20,000	per year		
Long-term O&M	\$25,000	per year		
Solidification				
Percent Cement	5.0%	(w/w)		
Cement	\$80	per ton	Mixing	\$25 per ton
<u>Dewatering - Upland Pond (2 cells)</u>		<u>Gravity &gt;250</u>		<u>Gravity &gt;SWAC</u>
Land Lease or Purchase	\$1.80	per sf		
Area	360,284	sf		360,284
Perimeter	2,401	lf		2,401
Depth of Material in Dewatering Cell	4	feet		
Cell Retention Time	24	hours		
Cell Depth	5	feet		
Mobilization	\$20,000	LS		
Clear and Grub	\$2,000	per acre		
Berm Volume	2.4	cy per lf		
Berm Construction	\$6	per cy		
Rough Grading	\$0.25	per sf		
Liner Purchase/Placement	\$0.50	per sf		
Demob/Disposal	\$10,000	LS		
Regrade Berm Soils	\$6	per cy		
Seed/Sod	\$1	per sy		
<u>Dewatering - Mechanical</u>				
Mobilization	\$100,000			
Holding Pond-Centrifuge	\$80	per bone dry ton		
<u>Water Treatment</u>				
Flow Rate	748	gpm		
Unit, Purchase	\$1,013,771	LS		
Water Treatment (Including Operator)	\$0.40	per 1,000 gallons		
Water Treatment QA	\$200	per day		
<u>Disposal</u>				
Off-Site Disposal				
Load Soil for Hauling	\$2.80	per ton		
Round-trip Hauling	2	hours		
Tipping Fee (non-TSCA)	\$43	per ton		
Tipping Fee (TSCA)	\$55	per ton		
Truck Rate	\$75	per hour		
Truck Load	32	tons		
<u>Institutional Controls</u>				
Public Education Program	\$100,000			
O&M Plans	\$20,000			
Deed Restrictions	\$5,000			
<u>Annual Costs</u>				
Public Education Program	\$30,000			
Maintaining O&M Plans	\$800			
Reporting	\$20,000			
Long-term Monitoring	\$20,000			

**ALTERNATIVE A: Dredge Sediment >250 ppb with Off-site Disposal****SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	2	Each	\$200,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	626	Day	\$2,629,200
Dredge Monitoring (Water Quality)	626	Day	\$500,800
Sediment Removal QA	626	Day	\$751,200
Site Restoration	2	Each	\$50,000
Direct Capital:			\$4,416,200
Engineering, Procurement & Construction Management:			529,944
Contractor Overhead/Profit:			662,430
<b>Total Capital:</b>			<b>\$5,600,000</b>

**SEDIMENT DEWATERING (GRAVITY)**

Land Lease or Purchase	360,284	sf	\$648,511
Mobilization	1	LS	\$20,000
Clear and Grub	360,284	sf	\$16,542
Berm Construction	5,762	cy	\$34,574
Rough Grading	360,284	sf	\$90,071
Liner Placement	360,284	sf	\$180,142
Demob/Disposal	1	LS	\$10,000
Regrade	5,762	cy	\$34,574
Seed/Sod	40,032	sy	\$40,032
Direct Capital:			\$1,074,445
Engineering, Procurement & Construction Management:			128,933
<b>Total Capital:</b>			<b>\$1,200,000</b>

**WATER TREATMENT**

748 gpm unit, Purchase	1	LS	\$1,013,771
Water Treatment (Includes Operator)	943,086,964	gal	\$377,235
Water Treatment QA	876	day	\$175,200
Direct Capital:			\$1,566,206
Engineering, Procurement & Construction Management:			187,945
<b>Total Capital:</b>			<b>\$1,800,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	950,680	ton	\$23,767,000
Cement Purchase	45,271	ton	\$3,621,680
Soil Loading	950,680	ton	\$2,661,904
Soil Hauling	950,680	ton	\$4,456,313
Tipping Fees (non-TSCA)	914,004	ton	\$39,302,174
Tipping Fees (TSCA)	36,676	ton	\$2,017,177
Direct Capital:			\$75,826,248
Engineering, Procurement & Construction Management:			9,099,150
<b>Total Capital:</b>			<b>\$84,900,000</b>
<b>TOTAL COST</b>			<b>\$93,500,000</b>

**ALTERNATIVE B: Dredge Sediment to SWAC with Off-site Disposal****SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	2	Each	\$200,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	435	Day	\$1,827,000
Dredge Monitoring (Water Quality)	435	Day	\$348,000
Sediment Removal QA	435	Day	\$522,000
Site Restoration	2	Each	\$50,000
Direct Capital:			\$3,232,000
Engineering, Procurement & Construction Management:			387,840
Contractor Overhead/Profit:			484,800
<b>Total Capital:</b>			<b>\$4,100,000</b>

**SEDIMENT DEWATERING (GRAVITY)**

Land Lease or Purchase	360,284	sf	\$648,511
Mobilization	1	LS	\$20,000
Clear and Grub	360,284	sf	\$16,542
Berm Construction	5,762	cy	\$34,574
Rough Grading	360,284	sf	\$90,071
Liner Placement	360,284	sf	\$180,142
Demob/Disposal	1	LS	\$10,000
Regrade	5,762	cy	\$34,574
Seed/Sod	40,032	sy	\$40,032
Direct Capital:			\$1,074,445
Engineering, Procurement & Construction Management:			128,933
<b>Total Capital:</b>			<b>\$1,200,000</b>

**WATER TREATMENT**

748 gpm unit, Purchase	1	LS	\$1,013,771
Water Treatment (Includes Operator)	654,430,901	gal	\$261,772
Water Treatment QA	608	Day	\$121,600
Direct Capital:			\$1,397,144
Engineering, Procurement & Construction Management:			167,657
<b>Total Capital:</b>			<b>\$1,600,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	659,700	ton	\$16,492,500
Cement Purchase	31,415	ton	\$2,513,200
Soil Loading	659,700	ton	\$1,847,160
Soil Hauling	659,700	ton	\$3,092,344
Tipping Fees (non-TSCA)	623,024	ton	\$26,790,034
Tipping Fees (TSCA)	36,676	ton	\$2,017,177
Direct Capital:			\$52,752,415
Engineering, Procurement & Construction Management:			6,330,290
<b>Total Capital:</b>			<b>\$59,100,000</b>

# INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			15,000
<b>Total Capital:</b>			<b>\$140,000</b>
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Long-term Monitoring	40	\$20,000	\$238,492
Public Education Program	40	\$30,000	\$357,738
Maintaining O&M Plans	40	\$800	\$9,540
Reporting	40	\$20,000	\$238,492
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$67,000,000</b>

**ALTERNATIVE C: Dredge Sediment to SWAC with on-site HTTD, Dispose in On-site CDF****SEDIMENT REMOVAL (MECHANICAL DREDGING)**

Capital Items	Quantity	Units	Cost
Dock Construction	1	LS	\$400,000
Mobilization - Equipment and Silt Curtain	1	LS	\$83,000
Watertight Barges	4	ea	\$400,000
Offload Stockpile Area Prep.	1	LS	\$75,000
Dredging - 10 hour shifts	126	Day	\$756,000
Dredge Monitoring (Air and Water Quality)	126	Day	\$100,800
Sediment Removal QA	126	Day	\$151,200
Offload Crane Mobilization	1	LS	\$50,000
Crane Offloading - 8 hour shifts	126	Day	\$365,400
Direct Capital:			\$2,381,400
Engineering, Procurement & Construction Management:			285,768
Contractor Overhead/Profit:			<u>357,210</u>
<b>Total Capital:</b>			<b>\$3,000,000</b>

**SEDIMENT TREATMENT (HIGH TEMPERATURE THERMAL DESORPTION)**

Capital Items	Quantity	Units	Cost
Setup Staging Area	2	LS	\$100,000
Mobilization/Site Prep	2	LS	\$300,000
Sand Purchase	21,960	ton	\$131,759
Blending	85,321	ton	\$2,133,019
Sediment Treatment	85,321	ton	\$6,399,057
Sediment Treatment QA	85,321	ton	\$170,642
Stack Testing	1	LS	\$50,000
Placement in CDF	47,400	ton	\$94,801
Direct Capital:			\$9,284,476
Engineering, Procurement & Construction Management:			<u>1,114,137</u>
<b>Total Capital:</b>			<b>\$10,400,000</b>

**SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	2	each	\$200,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	310	Day	\$1,302,000
Dredge Monitoring (Water Quality)	310	Day	\$248,000
Sediment Removal QA	310	Day	\$372,000
Site Restoration	1	LS	\$25,000
Direct Capital:			\$2,432,000
Engineering, Procurement & Construction Management:			291,840
Contractor Overhead/Profit:			<u>364,800</u>
<b>Total Capital:</b>			<b>\$3,100,000</b>

**CDF CONSTRUCTION - ARROWHEAD**

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	2,520,000	sf	\$4,536,000
Shot Rock/Rip Rap	8,000	lf	\$6,920,000
Sheetpile Placement	240,000	sf	\$4,560,000
Clean Soil Cap	190,000	cy	\$1,900,000
Seeding	280,000	sy	\$280,000
Mitigation	58	acre	\$578,512
Direct Capital:			\$18,774,512
Engineering, Procurement & Construction Management:			<u>2,252,941</u>
<b>Total Capital:</b>			<b>\$21,027,454</b>

Present Worth of Longer Term Operating Costs		Years	Annual Cost	
Mitigation	40	10,000		\$119,246
Long-term Monitoring	40	20,000		\$238,492
Long-term O&M	40	25,000		\$298,115
				<hr/>
Total Present Worth, Longer Term O&M Costs				\$655,854
Total Project Capital and O&M Cost				<b>\$21,700,000</b>



### CDF CONSTRUCTION - MENASHA

Capital Items	Quantity	Units	Cost
Mobilization/Site Prep	27,778	sf	\$50,000
Shot Rock/Rip Rap	9,200	lf	\$7,360,000
Sheetpile Placement	276,000	sf	\$5,244,000
Clean Soil Cap	170,000	cy	\$1,700,000
Seeding	250,000	sy	\$250,000
Mitigation	52	acre	\$516,529
Direct Capital:			\$15,120,529
Engineering, Procurement & Construction Management:			1,814,463
<b>Total Capital:</b>			<b>\$16,934,992</b>
Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115
Total Present Worth, Longer Term O&M Costs			\$655,854
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$17,600,000</b>

### WATER TREATMENT

Capital Items	Quantity	Units	Cost
748 gpm unit, Purchase	1	LS	\$1,013,771
Water Treatment (Includes Operator)	467,983,868	gal	\$187,194
Water Treatment QA	434	day	\$86,800
Direct Capital:			\$1,287,765
Engineering, Procurement & Construction Management:			154,532
<b>Total Capital:</b>			<b>\$1,400,000</b>

### INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			15,000
<b>Total Capital:</b>			<b>\$140,000</b>
Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Long-term Monitoring	40	\$20,000	\$238,492
Public Education Program	40	\$30,000	\$357,738
Maintaining O&M Plans	40	\$800	\$9,540
Reporting	40	\$20,000	\$238,492
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$58,200,000</b>

**ALTERNATIVE D: Dredge Sediment to SWAC with Off-site Disposal of TSCA materials and On-site CDF****SEDIMENT REMOVAL (6-INCH HORIZONTAL AUGER)**

<b>Capital Items</b>	<b>Quantity</b>	<b>Units</b>	<b>Cost</b>
Site Preparation	1	Each	\$100,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	105	Day	\$315,000
Dredge Monitoring (Water Quality)	105	Day	\$84,000
Sediment Removal QA	105	Day	\$126,000
Site Restoration	1	Each	\$25,000
Direct Capital:			\$935,000
Engineering, Procurement & Construction Management:			112,200
Contractor Overhead/Profit:			140,250
<b>Total Capital:</b>			<b>\$1,200,000</b>

**SEDIMENT DEWATERING (MECHANICAL)**

Mobilization/Site Prep	1	LS	\$100,000
Dewatering	17,465	bdt	\$1,397,177
Direct Capital:			\$1,497,177
Engineering, Procurement & Construction Management:			179,661
<b>Total Capital:</b>			<b>\$1,700,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

<b>Capital Items</b>	<b>Quantity</b>	<b>Units</b>	<b>Cost</b>
Solidification	36,677	ton	\$916,925
Cement Purchase	1,747	ton	\$139,760
Soil Loading	36,677	ton	\$102,696
Soil Hauling	36,677	ton	\$171,923
Tipping Fees	36,677	ton	\$2,017,235
Direct Capital:			\$3,348,539
Engineering, Procurement & Construction Management:			401,825
<b>Total Capital:</b>			<b>\$3,800,000</b>

**SEDIMENT REMOVAL (10-INCH HORIZONTAL AUGER)**

<b>Capital Items</b>	<b>Quantity</b>	<b>Units</b>	<b>Cost</b>
Site Preparation	1	Each	\$100,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	310	Day	\$1,302,000
Dredge Monitoring (Water Quality)	310	Day	\$248,000
Sediment Removal QA	310	Day	\$372,000
Site Restoration	1	Each	\$25,000
Direct Capital:			\$2,332,000
Engineering, Procurement & Construction Management:			279,840
Contractor Overhead/Profit:			349,800
<b>Total Capital:</b>			<b>\$3,000,000</b>

### CDF CONSTRUCTION - ARROWHEAD

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	2,520,000	sf	\$4,536,000
Shot Rock/Rip Rap	8,000	lf	\$6,920,000
Sheetpile Placement	240,000	sf	\$4,560,000
Clean Soil Cap	190,000	cy	\$1,900,000
Seeding	280,000	sy	\$280,000
Mitigation	58	acre	\$578,512
Direct Capital:			\$18,774,512
Engineering, Procurement & Construction Management:			2,252,941
<b>Total Capital:</b>			<b>\$21,027,454</b>
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115
Total Present Worth, Longer Term O&M Costs			\$655,854
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$21,700,000</b>

### CDF CONSTRUCTION - MENASHA

Capital Items	Quantity	Units	Cost
Mobilization/Site Prep	27,778	sf	\$50,000
Shot Rock/Rip Rap	9,200	lf	\$7,360,000
Sheetpile Placement	276,000	sf	\$5,244,000
Clean Soil Cap	170,000	cy	\$1,700,000
Seeding	250,000	sy	\$250,000
Mitigation	52	acre	\$516,529
Direct Capital:			\$15,120,529
Engineering, Procurement & Construction Management:			1,814,463
<b>Total Capital:</b>			<b>\$16,934,992</b>
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115
Total Present Worth, Longer Term O&M Costs			\$655,854
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$17,600,000</b>

### WATER TREATMENT

Capital Items	Quantity	Units	Cost
748 gpm unit, Purchase	1	LS	\$1,013,771
Water Treatment (Includes Operator)	503,099,738	gal	\$201,240
Water Treatment QA	580	Day	\$116,000
Direct Capital:			\$1,331,011
Engineering, Procurement & Construction Management:			159,721
<b>Total Capital:</b>			<b>\$1,500,000</b>

## INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			<u>15,000</u>
<b>Total Capital:</b>			<b>\$140,000</b>
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Long-term Monitoring	40	\$20,000	\$238,492
Public Education Program	40	\$30,000	\$357,738
Maintaining O&M Plans	40	\$800	\$9,540
Reporting	40	\$20,000	<u>\$238,492</u>
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$51,500,000</b>

**ALTERNATIVE E: Cap Sediment to Maximum Extent Possible and Dredge to SWAC with Off-site Disposal****SEDIMENT REMOVAL (MECHANICAL DREDGING)**

Capital Items	Quantity	Units	Cost
Dock Construction	1	LS	\$400,000
Mobilization - Equipment and Silt Curtain	1	LS	\$83,000
Water Tighten Barges	4	ea	\$400,000
Offload Stockpile Area Prep.	1	LS	\$75,000
Dredging - 10 hour shifts	17	Day	\$102,000
Dredge Monitoring (Water Quality)	17	Day	\$13,600
Sediment Removal QA	17	Day	\$20,400
Offload Crane Mobilization	1	LS	\$50,000
Crane Offloading - 8 hour shifts	17	Day	\$49,300
Direct Capital:			\$1,193,300
Engineering, Procurement & Construction Management:			143,196
Contractor Overhead/Profit:			178,995
<b>Total Capital:</b>			<b>\$1,500,000</b>

**CAPPING**

Capital Items	Quantity	Units	Cost
Mobilization/Site Prep	1	LS	\$100,000
Liner Purchase and Placement	6,479,673	sf	\$4,319,782
Cobble Purchase and Placement	119,994	cy	\$2,999,849
Cap Placement QA	1	LS	\$100,000
Direct Capital:			\$7,519,631
Engineering, Procurement & Construction Management:			902,356
<b>Total Capital:</b>			<b>\$8,421,987</b>

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Monitoring/O&M			
Long-term Monitoring	40	\$30,000	\$357,738
Long-term O&M	40	\$65,000	\$775,100
Total Present Worth, Longer Term O&M Costs			\$1,132,838
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$9,600,000</b>

**SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	2	Each	\$200,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	283	Day	\$1,188,600
Dredge Monitoring (Water Quality)	283	Day	\$226,400
Sediment Removal QA	283	Day	\$339,600
Site Restoration	2	Each	\$50,000
Direct Capital:			\$2,289,600
Engineering, Procurement & Construction Management:			274,752
Contractor Overhead/Profit:			343,440
<b>Total Capital:</b>			<b>\$2,900,000</b>

**SEDIMENT DEWATERING (GRAVITY)**

Land Lease or Purchase	360,284	sf	\$648,511
Mobilization	1	LS	\$20,000
Clear and Grub	360,284	sf	\$16,542
Berm Construction	5,762	cy	\$34,574
Rough Grading	360,284	sf	\$90,071
Liner Placement	360,284	sf	\$180,142
Demob/Disposal	1	LS	\$10,000
Regrade	5,762	cy	\$34,574
Seed/Sod	40,032	sy	\$40,032

Direct Capital:	\$1,074,445
Engineering, Procurement & Construction Management:	128,933

**Total Capital: \$1,200,000**

**WATER TREATMENT**

748 gpm unit, Purchase	1	LS	\$1,013,771
Water Treatment (Includes Operator)	425,942,631	gal	\$170,377
Water Treatment QA	396	Day	\$79,200

Direct Capital:	\$1,263,348
Engineering, Procurement & Construction Management:	151,602

**Total Capital: \$1,400,000**

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	437,764	ton	\$10,944,100
Cement Purchase	20,846	ton	\$1,667,680
Soil Loading	437,764	ton	\$1,225,739
Soil Hauling	437,764	ton	\$2,052,019
Tipping Fees (non-TSCA)	429,208	ton	\$18,455,944
Tipping Fees (TSCA)	8,557	ton	\$470,635

Direct Capital:	\$34,816,117
Engineering, Procurement & Construction Management:	4,177,934

**Total Capital: \$39,000,000**

**INSTITUTIONAL CONTROLS**

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000

Direct Capital:	\$125,000
Engineering, Procurement & Construction Management:	15,000

**Total Capital: \$140,000**

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Long-term Monitoring	40	\$20,000	\$238,492
Public Education Program	40	\$30,000	\$357,738
Maintaining O&M Plans	40	\$800	\$9,540
Reporting	40	\$20,000	\$238,492

Total Present Worth, Longer Term O&M Costs	\$844,263
--	-----------

**Total Project Capital and O&M Cost \$1,000,000**

**TOTAL COST \$56,600,000**

**BASIS FOR PRELIMINARY COST ESTIMATES**  
**SEDIMENT REMEDIATION**  
**FOX RIVER, WISCONSIN**  
**APPLETON TO LITTLE RAPIDS**

**Material Handling Assumptions:**

Volume > 250 ppb	337,797	cy	257,860	m3
Solids Specific Gravity	2.4			
Fresh Water Density	62.4	lb/ft3		
In Situ Density	24.2%	w/w	13.5%	v/v
Horizontal Auger Slurry Density (30% in situ)	9.2%	w/w	4.0%	v/v
Dewatered Density	50%	w/w	29.4%	v/v
			1.00	tons per cy
			0.89	tons per cy
			1.19	tons per cy

**Cost Estimating Parameters & Methodology:**

Interest Rate	8.0%
Sales Tax	5.5%
Engineering, Procurement and Construction Mgmt	12.0%
Contractor Overhead and Profit - Dredging Only	15.0%

Dredging

Dredge Monitoring (Water Quality)	\$800	per day
Sediment Removal QA	\$1,200	per day

Hydraulic Low Solids - 6-inch Horizontal Auger (673 gpm)

Site Preparation	\$100,000	LS
Mobilization - Equipment	\$250,000	per dredge
Mobilization - Silt Curtain	\$35,000	
Shift Rate (12 hours)	\$3,000	per shift
Dredge Rate	600	cy in situ per 12 hour shift
Site Restoration	\$25,000	LS

Solidification

Percent Cement	5%		
Cement	\$80	per ton	Mixing
			\$25 per ton

Dewatering - Upland Pond

Land Lease or Purchase	\$1.80	per acre
Area	82,767	sf
Perimeter	1,151	lf
Depth of Material in Dewatering Cell	4	feet
Cell Retention Time	24	hours
Cell Depth	5	feet
Mobilization	\$20,000	LS
Clear and Grub	\$2,000	per acre
Berm Volume	2.4	cy per lf
Berm Construction	\$6	per cy
Rough Grading	\$0.25	per sf
Liner Purchase/Placement	\$0.50	per sf
Demob/Disposal	\$10,000	LS
Regrade Berm Soils	\$6	per cy
Seed/Sod	\$1	per sy

Water Treatment

Flow Rate	173	gpm
Unit, Purchase	\$420,850	LS
Water Treatment (Including Operator)	\$0.40	per 1,000 gallons
Water Treatment QA	\$200	per day

Disposal

Off-Site Disposal

Load Soil for Hauling	\$2.80	per ton
Round-trip Hauling	2	hours
Tipping Fee (non-TSCA)	\$43	per ton
Tipping Fee (TSCA)	\$55	per ton
Truck Rate	\$75	per hour
Truck Load	32	tons

Institutional Controls

Public Education Program	\$100,000
O&M Plans	\$20,000
Deed Restrictions	\$5,000
<u>Annual Costs</u>	
Public Education Program	\$30,000
Maintaining O&M Plans	\$800
Reporting	\$20,000
Long-term Monitoring	\$20,000

**ALTERNATIVE A: Dredge Sediment >250 ppb with Off-site Disposal****SEDIMENT REMOVAL (HORIZONTAL AUGER)**

<b>Capital Items</b>	<b>Quantity</b>	<b>Units</b>	<b>Cost</b>
Site Preparation	5	ea	\$500,000
Mobilization - Equipment and Silt Curtain	5	ea	\$1,425,000
Dredging - 12 hour shifts	563	Day	\$1,689,000
Dredge Monitoring (Water Quality)	563	Day	\$450,400
Sediment Removal QA	563	Day	\$675,600
Site Restoration	5	ea	\$125,000
Direct Capital:			\$4,865,000
Engineering, Procurement & Construction Management:			583,800
Contractor Overhead/Profit:			<u>729,750</u>
<b>Total Capital:</b>			<b>\$6,200,000</b>

**SEDIMENT DEWATERING (GRAVITY)**

Land Lease or Purchase	82,767	sf	\$148,980
Mobilization	1	LS	\$20,000
Clear and Grub	82,767	sf	\$3,800
Berm Construction	2,762	cy	\$16,571
Rough Grading	82,767	sf	\$20,692
Liner Placement	82,767	sf	\$41,383
Demob/Disposal	1	LS	\$10,000
Regrade	2,762	cy	\$16,571
Seed/Sod	9,196	sy	\$9,196
Direct Capital:			\$287,194
Engineering, Procurement & Construction Management:			<u>34,463</u>
<b>Total Capital:</b>			<b>\$320,000</b>

**WATER TREATMENT**

173 gpm unit, Purchase	1	LS	\$420,850
Water Treatment (Including Operator)	196,092,053	gal	\$78,437
Water Treatment QA	789	Days	\$157,800
Direct Capital:			\$657,087
Engineering, Procurement & Construction Management:			<u>78,850</u>
<b>Total Capital:</b>			<b>\$740,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

<b>Capital Items</b>	<b>Quantity</b>	<b>Units</b>	<b>Cost</b>
Solidification	184,438	ton	\$4,610,950
Cement Purchase	9,220	ton	\$737,600
Soil Loading	184,438	ton	\$516,426
Soil Hauling	184,438	ton	\$864,553
Tipping Fees	184,438	ton	\$7,930,834
Direct Capital:			\$14,660,364
Engineering, Procurement & Construction Management:			<u>1,759,244</u>
<b>Total Capital:</b>			<b>\$16,400,000</b>
<b>TOTAL COST</b>			<b>\$23,660,000</b>



**ALTERNATIVE B: Institutional Controls****INSTITUTIONAL CONTROLS**

<b>Capital Items</b>	<b>Quantity</b>	<b>Units</b>	<b>Cost</b>
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			15,000
<b>Total Capital:</b>			<b>\$140,000</b>
<b>Present Worth of Longer Term Operating Costs</b>			
<u>Institutional Controls</u>	<b>Years</b>	<b>Annual Cost</b>	
Long-term Monitoring	40	\$20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$1,000,000</b>

**BASIS FOR PRELIMINARY COST ESTIMATES  
SEDIMENT REMEDIATION  
FOX RIVER, WISCONSIN  
LITTLE RAPIDS TO DEPERE DAM**

**Material Handling Assumptions:**

Volume > 250 ppb	1,187,987	cy		906,860	m3
Volume > SWAC	1,065,014	cy		812,988	m3
Volume > SWAC Not Capped	593,220	cy		452,840	m3
Solids Specific Gravity	2.47				
Fresh Water Density	62.4	lb/ft3			
In Situ Density	37.1%	w/w	23.2% v/v	1.13	tons per cy
Horizontal Auger Slurry Density (30% in situ)	15.6%	w/w	7.0% v/v	0.93	tons per cy
Dewatered Density	50%	w/w	28.8% v/v	1.20	tons per cy

**Cost Estimating Parameters & Methodology:**

Interest Rate	8.0%
Sales Tax	5.5%
Engineering, Procurement and Construction Mgmt	12.0%
Contractor Overhead and Profit - Dredging Only	15.0%

**Dredging**

Dredge Monitoring (Water Quality)	\$800	per day
Sediment Removal QA	\$1,200	per day
Hydraulic Low Solids - 10-inch Horizontal Auger (2917 gpm)		
Site Preparation	\$100,000	LS
Mobilization - Equipment	\$250,000	per dredge
Mobilization - Silt Curtain	\$35,000	
Shift Rate (12 hours)	\$4,200	per shift
Dredge Rate	2600	cy in situ per 12 hour shift
Site Restoration	\$25,000	LS
Length of Piping	7000	ft
Piping Purchase/Installation	\$15	per ft
Number of Road Crossings	12	each
Cost per Road Crossing	\$50,000	per crossing
Number of Booster Pumps	1	each
Booster Pump Cost	\$20,000	each

**Capping**

Mobilization/Site Prep	\$100,000		
Full Cap Area	11,814,870	sf	1,097,664 m2
Partial Cap Area	7,753,024	sf	720,297 m2
Sand Cap Depth	1.5	feet	
Placement Rate	200	cy per day	
Shift Rate (10 hours)	\$2,000	per shift	
Sand Purchase	\$6	per ton	
Sand Density	1.4	tons per cy	
Armored Cap Depth	0.5	feet	
Cobbles	\$25	per cy	
Cap Placement QA	\$100,000	LS	
Long-term O&M	\$65,000	per year	
Long-term Monitoring	\$30,000	per year	

**Nearshore CDF**

Land Lease or Purchase	\$1.80	per sf
Length	9,600	lf
Capping Volume	205,000	cy
Seeding Area	300,000	sy
Sheetpile Wall Length	9,600	lf
Sheetpile Depth	30	ft
Sheetpile Cost	\$19	per sf
Shot Rock Berm	\$500	per lf
Rip Rap	\$210	per lf
Clean Soil Cap	\$10	per cy
Seeding	\$1	per sy
Mitigation	\$10,000	per acre
	\$10,000	per year
Long-term Monitoring	\$20,000	per year
Long-term O&M	\$25,000	per year

**Solidification**

Percent Cement	5%		
Cement	\$80	per ton	Mixing \$25 per ton

Dewatering - Upland Pond

Land Lease or Purchase	\$1.80	per sf
Area	360,284	sf
Perimeter	2,401	lf
Depth of Material in Dewatering Cell	4	feet
Cell Retention Time	24	hours
Cell Depth	5	feet
Mobilization	\$20,000	LS
Clear and Grub	\$2,000	per acre
Berm Volume	2.4	cy per lf
Berm Construction	\$6	per cy
Rough Grading	\$0.25	per sf
Liner Placement	\$0.50	per sf
Demob/Disposal	\$10,000	LS
Regrade Berm Soils	\$6	per cy
Seed/Sod	\$1	per sy

Water Treatment

Flow Rate	658	gpm
Unit, Purchase	\$939,185	LS
Water Treatment (Including Operator)	\$0.40	per 1,000 gallons
Water Treatment QA	\$200	per day

Disposal

## Off-Site Disposal

Load Soil for Hauling	\$2.80	per ton
Round-trip Hauling	2	hours
Tipping Fee	\$43	per ton
Truck Rate	\$75	per hour
Truck Load	32	tons

## New Landfill Disposal

Landfill Construction	\$14,000,000
-----------------------	--------------

Institutional Controls

Public Education Program	\$100,000
O&M Plans	\$20,000
Deed Restrictions	\$5,000

Annual Costs

Public Education Program	\$30,000
Maintaining O&M Plans	\$800
Reporting	\$20,000
Long-term Monitoring	\$20,000

**ALTERNATIVE A: Dredge Sediment >250 ppb with Off-site Disposal****SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	1	LS	\$100,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	457	Day	\$1,919,400
Dredge Monitoring (Water Quality)	457	Day	\$365,600
Sediment Removal QA	457	Day	\$548,400
Site Restoration	1	LS	\$25,000
Direct Capital:			\$3,243,400
Engineering, Procurement & Construction Management:			389,208
Contractor Overhead/Profit:			<u>486,510</u>
<b>Total Capital:</b>			<b>\$4,100,000</b>

**SEDIMENT DEWATERING (GRAVITY)**

Land Lease or Purchase	360,284	sf	\$648,511
Mobilization	1	LS	\$20,000
Clear and Grub	360,284	sf	\$16,542
Berm Construction	5,762	cy	\$34,574
Rough Grading	360,284	sf	\$90,071
Liner Placement	360,284	sf	\$180,142
Demob/Disposal	1	LS	\$10,000
Regrade	5,762	cy	\$34,574
Seed/Sod	40,032	sy	\$40,032
Direct Capital:			\$1,074,445
Engineering, Procurement & Construction Management:			<u>128,933</u>
<b>Total Capital:</b>			<b>\$1,200,000</b>

**WATER TREATMENT**

658 gpm unit, Purchase	1	LS	\$939,185
Water Treatment (Including Operator)	606,504,221	gal	\$242,602
Water Treatment QA	640	Day	\$128,000
Direct Capital:			\$1,309,786
Engineering, Procurement & Construction Management:			<u>157,174</u>
<b>Total Capital:</b>			<b>\$1,500,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	1,204,913	ton	\$30,122,825
Cement Purchase	57,377	ton	\$4,590,160
Soil Loading	1,204,913	ton	\$3,373,756
Soil Hauling	1,204,913	ton	\$5,648,030
Tipping Fees	1,204,913	ton	\$51,811,259
Direct Capital:			\$95,546,030
Engineering, Procurement & Construction Management:			<u>11,465,524</u>
<b>Total Capital:</b>			<b>\$107,000,000</b>
<b>TOTAL COST</b>			<b>\$113,800,000</b>

**ALTERNATIVE B: Dredge Sediment >250 ppb and Pump Dredged Sediment to Off-site Landfill****SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	1	LS	\$100,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	457	Day	\$1,919,400
Dredge Monitoring (Water Quality)	457	Day	\$365,600
Sediment Removal QA	457	Day	\$548,400
Piping	7000	ft	\$105,000
Road Crossings	12	ea	\$600,000
Booster Pumps	1	ea	\$20,000
Site Restoration	1	LS	\$25,000
Direct Capital:			\$3,968,400
Engineering, Procurement & Construction Management:			476,208
Contractor Overhead/Profit:			<u>595,260</u>
<b>Total Capital:</b>			<b>\$5,000,000</b>

**WATER TREATMENT**

658 gpm unit, Purchase	1	LS	\$939,185
Water Treatment (Including Operator)	606,504,221	gal	\$242,602
Water Treatment QA	640	Day	\$128,000
Direct Capital:			\$1,309,786
Engineering, Procurement & Construction Management:			<u>157,174</u>
<b>Total Capital:</b>			<b>\$1,500,000</b>

**SEDIMENT DISPOSAL (OFF-SITE NR500 LANDFILL)**

Capital Items	Quantity	Units	Cost
Landfill Construction	1	LS	\$14,000,000
Direct Capital:			\$14,000,000
Engineering, Procurement & Construction Management:			<u>1,680,000</u>
<b>Total Capital:</b>			<b>\$15,700,000</b>
<b>TOTAL COST</b>			<b>\$22,200,000</b>

**ALTERNATIVE C: Dredge Sediment to SWAC with Off-site Disposal****SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	1	LS	\$100,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	410	Day	\$1,722,000
Dredge Monitoring (Air and Water Quality)	410	Day	\$328,000
Sediment Removal QA	410	Day	\$492,000
Site Restoration	1	LS	\$25,000
Direct Capital:			\$2,952,000
Engineering, Procurement & Construction Management:			354,240
Contractor Overhead/Profit:			442,800
<b>Total Capital:</b>			<b>\$3,700,000</b>

**SEDIMENT DEWATERING (GRAVITY)**

Land Lease or Purchase	360,284	sf	\$648,511
Mobilization	1	LS	\$20,000
Clear and Grub	360,284	sf	\$16,542
Berm Construction	5,762	cy	\$34,574
Rough Grading	360,284	sf	\$90,071
Liner Placement	360,284	sf	\$180,142
Demob/Disposal	1	LS	\$10,000
Regrade	5,762	cy	\$34,574
Seed/Sod	40,032	sy	\$40,032
Direct Capital:			\$1,074,445
Engineering, Procurement & Construction Management:			128,933
<b>Total Capital:</b>			<b>\$1,200,000</b>

**WATER TREATMENT**

658 gpm unit, Purchase	1	LS	\$939,185
Water Treatment (Including Operator)	543,723,015	gal	\$217,489
Water Treatment QA	574	Day	\$114,800
Direct Capital:			\$1,271,474
Engineering, Procurement & Construction Management:			152,577
<b>Total Capital:</b>			<b>\$1,400,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	1,080,189	ton	\$27,004,725
Cement Purchase	51,438	ton	\$4,115,040
Soil Loading	1,080,189	ton	\$3,024,529
Soil Hauling	1,080,189	ton	\$5,063,386
Tipping Fees	1,080,189	ton	\$46,448,127
Direct Capital:			\$85,655,807
Engineering, Procurement & Construction Management:			10,278,697
<b>Total Capital:</b>			<b>\$95,900,000</b>

## INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			15,000
<b>Total Capital:</b>			<b>\$140,000</b>
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Long-term Monitoring	40	20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$103,200,000</b>

**ALTERNATIVE D: Dredge Sediment to SWAC with On-site CDF****SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	1	LS	\$100,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	410	Day	\$1,722,000
Dredge Monitoring (Air and Water Quality)	410	Day	\$328,000
Sediment Removal QA	410	Day	\$492,000
Site Restoration	1	LS	\$25,000
Direct Capital:			\$2,952,000
Engineering, Procurement & Construction Management:			354,240
Contractor Overhead/Profit:			442,800
<b>Total Capital:</b>			<b>\$3,700,000</b>

**WATER TREATMENT**

658 gpm unit, Purchase	1	LS	\$939,185
Water Treatment (Including Operator)	543,723,015	gal	\$217,489
Water Treatment QA	574	Day	\$114,800
Direct Capital:			\$1,271,474
Engineering, Procurement & Construction Management:			152,577
<b>Total Capital:</b>			<b>\$1,400,000</b>

**CDF CONSTRUCTION**

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	2,700,000	sf	\$4,860,000
Shot Rock/Rip Rap	9,600	lf	\$6,816,000
Sheetpile Placement	288,000	sf	\$5,472,000
Clean Soil Cap	205,000	cy	\$2,050,000
Seeding	300,000	sy	\$300,000
Mitigation	62	acre	\$619,834.71
Direct Capital:			\$20,117,835
Engineering, Procurement & Construction Management:			2,414,140
<b>Total Capital:</b>			<b>\$22,531,975</b>

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115
Total Present Worth, Longer Term O&M Costs			\$655,854
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$23,200,000</b>

**INSTITUTIONAL CONTROLS**

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			15,000
<b>Total Capital:</b>			<b>\$140,000</b>

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Long-term Monitoring	40	20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$29,300,000</b>



# **ALTERNATIVE E: Cap Sediment to Maximum Extent Possible and Dredge to SWAC with On-site CDF**

## **CAPPING**

Capital Items	Quantity	Units	Cost
Mobilization/Site Prep	1	LS	\$100,000
Sand Purchase	603,013	tons	\$3,618,078
Placement - 10-hour shifts	2,154	Day	\$4,308,000
Cobble Purchase and Placement	143,575	cy	\$3,589,363
Cap Placement QA	1	LS	\$100,000
Direct Capital:			\$11,715,441
Engineering, Procurement & Construction Management:			1,405,853
Total Capital:			\$13,121,294
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Monitoring/O&M			
Long-term Monitoring	40	\$30,000	\$357,738
Long-term O&M	40	\$65,000	\$775,100
Total Present Worth, Longer Term O&M Costs			\$1,132,838
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$14,300,000</b>

## **SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	1	LS	\$100,000
Mobilization - Equipment and Silt Curtain	1	LS	\$285,000
Dredging - 12 hour shifts	229	Day	\$961,800
Dredge Monitoring (Air and Water Quality)	229	Day	\$183,200
Sediment Removal QA	229	Day	\$274,800
Site Restoration	1	LS	\$25,000
Direct Capital:			\$1,829,800
Engineering, Procurement & Construction Management:			219,576
Contractor Overhead/Profit:			274,470
<b>Total Capital:</b>			<b>\$2,300,000</b>

## **WATER TREATMENT**

Capital Items	Quantity	Units	Cost
658 gpm unit, Purchase	1	LS	\$939,185
Water Treatment (Including Operator)	302,857,521	gal	\$121,143
Water Treatment QA	320	Day	\$64,000
Direct Capital:			\$1,124,328
Engineering, Procurement & Construction Management:			134,919
<b>Total Capital:</b>			<b>\$1,300,000</b>

## **CDF CONSTRUCTION**

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	2,700,000	sf	\$4,860,000
Shot Rock/Rip Rap	9,600	lf	\$6,816,000
Sheetpile Placement	288,000	sf	\$5,472,000
Clean Soil Cap	205,000	cy	\$2,050,000
Seeding	300,000	sy	\$300,000
Mitigation	62	acre	\$619,834.71
Direct Capital:			\$20,117,835
Engineering, Procurement & Construction Management:			2,414,140
<b>Total Capital:</b>			<b>\$22,531,975</b>
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115
Total Present Worth, Longer Term O&M Costs			\$655,854
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$23,200,000</b>

## INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			15,000
<b>Total Capital:</b>			<b>\$140,000</b>
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Long-term Monitoring	40	20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$42,100,000</b>

## ALTERNATIVE F: Cap All Sediment

### CAPPING

Capital Items	Quantity	Units	Cost
Mobilization/Site Prep	1	LS	\$100,000
Sand Purchase	918,935	tons	\$5,513,610
Placement - 10-hour shifts	3,282	Day	\$6,564,000
Cobble Purchase and Placement	218,794	cy	\$5,469,847
Cap Placement QA	1	LS	\$100,000
Direct Capital:			\$17,747,457
Engineering, Procurement & Construction Management:			2,129,695
Total Capital:			\$19,877,152
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
<u>Monitoring/O&amp;M</u>			
Long-term Monitoring	40	\$30,000	\$357,738
Long-term O&M	40	\$65,000	\$775,100
Total Present Worth, Longer Term O&M Costs			\$1,132,838
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$21,000,000</b>

### INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			15,000
<b>Total Capital:</b>			<b>\$140,000</b>
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
Long-term Monitoring	40	20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$22,000,000</b>

**BASIS FOR PRELIMINARY COST ESTIMATES**  
**SEDIMENT REMEDIATION**  
**FOX RIVER, WISCONSIN**  
**DE PERE DAM TO GREEN BAY**

**Material Handling Assumptions:**

Volume > 250 ppb	5,690,640	cy		4,344,000	m3
Volume > SWAC	5,065,822	cy		3,867,040	m3
Volume > 50 ppm	247,996	cy		189,310	m3
Volume > SWAC w/CDF	4,719,589	cy		3,602,740	m3
Volume > SWAC Not Capped	4,259,024	cy		3,251,163	m3
Solids Specific Gravity	2.36				
Fresh Water Density	62.4	lb/ft3			
In Situ Density	33.8%	w/w	20.9% v/v	1.08	tons per cy
Hydraulic Dredge Slurry Density (15% in situ)	7.1%	w/w	3.1% v/v	0.88	tons per cy
Dewatered Density	50%	w/w	29.8% v/v	1.18	tons per cy
Treated Density	90%	w/w	84.6% v/v	1.92	tons per cy

**Cost Estimating Parameters & Methodology:**

Interest Rate	8.0%
Sales Tax	5.5%
Engineering, Procurement and Construction Mgmt	12.0%
Contractor Overhead and Profit - Dredging Only	15.0%

Dredging

Dredge Monitoring (Water Quality)	\$800	per day
Sediment Removal QA	\$1,200	per day

Hydraulic Low Solids - 10-inch Horizontal Auger (2917 gpm)

Site Preparation	\$100,000	LS
Mobilization - Equipment	\$250,000	per dredge
Mobilization - Silt Curtain	\$35,000	
Shift Rate (12 hours)	\$4,200	per shift
Dredge Rate	2600	cy in situ per 12 hour shift
Site Restoration	\$25,000	LS
Length of Piping	132,000	ft
Piping Purchase/Installation	\$15	per ft
Number of Road Crossings	12	each
Cost per Road Crossing	\$50,000	per crossing
Number of Booster Pumps	7	each
Booster Pump Cost	\$20,000	each

Mechanical

Mobilization - Equipment	\$48,000	per dredge
Mobilization - Silt Curtain	\$35,000	LS
Mobilization - Watertighten Barge	\$100,000	ea
Shift Rate (12 hours)	\$6,000	per shift
Dredge Rate	1,800	cy in situ per 12 hour shift
Offload Stockpile Area Prep.	\$75,000	LS
Barge Capacity	1,800	cy
Free Water per cy Dredged (10%)	20	gal
Offload Shift Rate (12 hours)	\$2,900	per shift
Upland Offloading Rate	1,800	cy per shift
Barge Movement Time	4	hours
Offload Crane Mobilization	\$50,000	LS
Site Restoration	\$25,000	LS

Sediment Treatment

High Temperature Thermal Desorption

Setup Staging Area	\$50,000	
Mobilization/Site Prep	\$150,000	
Sediment Treatment QA	\$2	per ton
Ratio of Amending Sand Volume to Dredge Vol.	0.25	:1
Sand Purchase and Deliver	\$6	per ton
Blending	\$25	per ton
HTTD (includes off-gas treatment)	\$75	per ton
Stack Testing	\$50,000	LS
Placement in CDF	\$2	per ton

Capping

Mobilization/Site Prep	\$100,000		
Cap Area	6,075,811	sf	564,475 m2
Sand Cap Depth	1.5	feet	
Placement Rate	200	cy per day	
Shift Rate (10 hours)	\$2,000	per shift	
Sand Purchase	\$6	per ton	
Sand Density	1.4	tons per cy	
Armored Cap Depth	0.5	feet	
Cobbles	\$25	per cy	
Cap Placement QA	\$100,000	LS	
Long-term O&M	\$65,000	per year	
Long-term Monitoring	\$30,000	per year	

Nearshore CDF		<u>Designed</u>		<u>Proposed</u>	
Land Lease or Purchase		\$1.80	per sf	\$1.80	
Length		9,600	lf	16,000	
Capping Volume		205,000	cy	330,000	
Seeding Area		300,000	sy	500,000	
Sheetpile Wall Length		9,600	lf	16,000	
Sheetpile Depth		30	ft	30	
Sheetpile Cost		\$19	per sf	\$19	
Shot Rock Berm		\$500	per lf	\$500	
Rip Rap		\$210	per lf	\$210	
Clean Soil Cap		\$10	per cy	\$10	
Seeding		\$1	per sy	\$1	
Mitigation		\$10,000	per acre		
		\$10,000	per year		
Long-term Monitoring		\$20,000	per year		
Long-term O&M		\$25,000	per year		
Solidification					
Percent Cement		5%	(w/w)		
Cement		\$80	per ton	Mixing	\$25 per ton
<u>Water Treatment</u>					
Flow Rate		215	gpm (3 dredges)	287	gpm (4 dredges)
Unit, Purchase		\$479,953	LS	\$570,377	
Flow Rate (2 Hydraulic Dredges)		3,107	gpm		
Unit, Purchase (Hydraulic Dredge)		\$2,382,582	LS		
Water Treatment (Including Operator)		\$0.40	per 1,000 gallons		
Water Treatment QA		\$200	per day		
<u>Disposal</u>					
Off-Site Disposal					
Load Soil for Hauling		\$2.80	per ton		
Round-trip Hauling		2	hours		
Tipping Fee (non-TSCA)		\$43	per ton		
Tipping Fee (TSCA)		\$55	per ton		
Truck Rate		\$75	per hour		
Truck Load		32	tons		
New Landfill Disposal					
Landfill Construction		\$14,000,000			
<u>Institutional Controls</u>					
Public Education Program		\$100,000			
O&M Plans		\$20,000			
Deed Restrictions		\$5,000			
<u>Annual Costs</u>					
Public Education Program		\$30,000			
Maintaining O&M Plans		\$800			
Reporting		\$20,000			
Long-term Monitoring		\$20,000			

**ALTERNATIVE A: Dredge Sediment to >250 ppb with Off-site Disposal****SEDIMENT REMOVAL (MECHANICAL DREDGING)**

Capital Items	Quantity	Units	Cost
Mobilization - Equipment and Silt Curtain	4	LS	\$332,000
Watertight Barges	4	ea	\$400,000
Offload Stockpile Area Prep.	1	LS	\$75,000
Dredging - 12 hour shifts	3,162	Day	\$18,972,000
Dredge Monitoring (Water Quality)	3,162	Day	\$2,529,600
Sediment Removal QA	3,162	Day	\$3,794,400
Offload Crane Mobilization	1	LS	\$50,000
Crane Offloading - 8 hour shifts	3,162	Day	\$9,169,800
Direct Capital:			\$35,322,800
Engineering, Procurement & Construction Management:			4,238,736
Contractor Overhead/Profit:			5,298,420
<b>Total Capital:</b>			<b>\$44,900,000</b>

**WATER TREATMENT**

287 gpm unit, Purchase	1	LS	\$570,377
Water Treatment (Including Operator)	456,922,546	gal	\$182,769
Water Treatment QA	1,107	Day	\$221,400
Direct Capital:			\$974,546
Engineering, Procurement & Construction Management:			116,946
<b>Total Capital:</b>			<b>\$1,100,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	4,966,761	ton	\$124,169,025
Cement Purchase	236,513	ton	\$18,921,040
Soil Loading	4,966,761	ton	\$13,906,931
Soil Hauling	4,966,761	ton	\$23,281,692
Tipping Fees (non-TSCA)	4,750,311	ton	\$204,263,386
Tipping Fees (TSCA)	216,450	ton	\$11,904,734
Direct Capital:			\$396,446,807
Engineering, Procurement & Construction Management:			47,573,617
<b>Total Capital:</b>			<b>\$444,000,000</b>
<b>TOTAL COST</b>			<b>\$490,000,000</b>

**ALTERNATIVE B: Dredge Sediment to >250 ppb and Pump Dredged Sediment to Off-site Landfill****SEDIMENT REMOVAL (HORIZONTAL AUGER)**

Capital Items	Quantity	Units	Cost
Site Preparation	1	LS	\$100,000
Mobilization - Equipment and Silt Curtain	2	LS	\$570,000
Dredging - 12 hour shifts	2189	Day	\$9,193,800
Dredge Monitoring (Water Quality)	2189	Day	\$1,751,200
Sediment Removal QA	2189	Day	\$2,626,800
Piping	132,000	ft	\$1,980,000
Road Crossings	12	ea	\$600,000
Booster Pumps	7	ea	\$140,000
Site Restoration	1	LS	\$25,000
Direct Capital:			\$16,986,800
Engineering, Procurement & Construction Management:			2,038,416
Contractor Overhead/Profit:			<u>2,548,020</u>
<b>Total Capital:</b>			<b>\$21,600,000</b>

**WATER TREATMENT**

3107 gpm unit, Purchase	1	LS	\$2,382,582
Water Treatment (Including Operator)	6,854,590,422	gal	\$2,741,836
Water Treatment QA	3,065	Day	\$613,000
Piping	132,000	ft	\$1,980,000
Direct Capital:			\$7,717,419
Engineering, Procurement & Construction Management:			<u>926,090</u>
<b>Total Capital:</b>			<b>\$8,600,000</b>

**SEDIMENT DISPOSAL (OFF-SITE NR500 LANDFILL)**

Capital Items	Quantity	Units	Cost
Landfill Construction	1	LS	\$14,000,000
Direct Capital:			\$14,000,000
Engineering, Procurement & Construction Management:			<u>1,680,000</u>
<b>Total Capital:</b>			<b>\$15,700,000</b>
<b>TOTAL COST</b>			<b>\$45,900,000</b>

**ALTERNATIVE C: Dredge Sediment to SWAC with Off-site Disposal****SEDIMENT REMOVAL (MECHANICAL DREDGING)**

Capital Items	Quantity	Units	Cost
Mobilization - Equipment and Silt Curtain	3	LS	\$249,000
Watertight Barges	4	ea	\$400,000
Offload Stockpile Area Prep.	1	LS	\$75,000
Dredging - 12 hour shifts	2,815	Day	\$16,890,000
Dredge Monitoring (Water Quality)	2,815	Day	\$2,252,000
Sediment Removal QA	2,815	Day	\$3,378,000
Offload Crane Mobilization	1	LS	\$50,000
Crane Offloading - 8 hour shifts	2,815	Day	\$8,163,500
Direct Capital:			\$31,457,500
Engineering, Procurement & Construction Management:			3,774,900
Contractor Overhead/Profit:			4,718,625
<b>Total Capital:</b>			<b>\$40,000,000</b>

**WATER TREATMENT**

215 gpm unit, Purchase	1	LS	\$479,953
Water Treatment (Including Operator)	406,753,628	gal	\$162,701
Water Treatment QA	1,314	Day	\$262,800
Direct Capital:			\$905,455
Engineering, Procurement & Construction Management:			108,655
<b>Total Capital:</b>			<b>\$1,000,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	4,421,423	ton	\$110,535,575
Cement Purchase	210,544	ton	\$16,843,520
Soil Loading	4,421,423	ton	\$12,379,984
Soil Hauling	4,421,423	ton	\$20,725,420
Tipping Fees (non-TSCA)	4,204,973	ton	\$180,813,853
Tipping Fees (TSCA)	216,450	ton	\$11,904,733
Direct Capital:			\$353,203,085
Engineering, Procurement & Construction Management:			\$42,384,370
<b>Total Capital:</b>			<b>\$395,600,000</b>

**INSTITUTIONAL CONTROLS**

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000
Direct Capital:			\$125,000
Engineering, Procurement & Construction Management:			\$15,000
<b>Total Capital:</b>			<b>\$140,000</b>

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Long-term Monitoring	40	20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492
Total Present Worth, Longer Term O&M Costs			\$844,263
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$1,000,000</b>
<b>TOTAL COST</b>			<b>\$437,600,000</b>



**ALTERNATIVE D: Dredge Sediment to SWAC, On-site HTTD, Dispose in On-site CDF**

**SEDIMENT REMOVAL (MECHANICAL DREDGING)**

Capital Items	Quantity	Units	Cost
Mobilization - Equipment and Silt Curtain	3	LS	\$249,000
Watertight Barges	4	ea	\$400,000
Offload Stockpile Area Prep.	1	LS	\$75,000
Dredging - 12 hour shifts	2,622	Day	\$15,732,000
Dredge Monitoring (Water Quality)	2,622	Day	\$2,097,600
Sediment Removal QA	2,622	Day	\$3,146,400
Offload Crane Mobilization	1	LS	\$50,000
Crane Offloading - 8 hour shifts	2,622	Day	\$7,603,800
Direct Capital:			\$29,353,800
Engineering, Procurement & Construction Management:			\$3,522,456
Contractor Overhead/Profit:			\$4,403,070
<b>Total Capital:</b>			<b>\$37,300,000</b>

**SEDIMENT TREATMENT (HIGH TEMPERATURE THERMAL DESORPTION)**

Capital Items	Quantity	Units	Cost
Setup Staging Area	1	LS	\$50,000
Mobilization/Site Prep	1	LS	\$150,000
Sand Purchase	51,536	ton	\$309,214
Blending	257,678	ton	\$6,441,953
Sediment Treatment	257,678	ton	\$19,325,860
Sediment Treatment QA	257,678	ton	\$515,356
Stack Testing	1	LS	\$50,000
Placement in CDF	143,155	ton	\$286,309
Direct Capital:			\$27,128,693
Engineering, Procurement & Construction Management:			\$3,255,443
<b>Total Capital:</b>			<b>\$30,400,000</b>

**WATER TREATMENT**

215 gpm unit, Purchase	1	LS	\$479,953
Water Treatment (Including Operator)	378,953,299	gal	\$151,581
Water Treatment QA	1,224	Day	\$244,800
Direct Capital:			\$876,334
Engineering, Procurement & Construction Management:			\$105,160
<b>Total Capital:</b>			<b>\$1,000,000</b>

**CDF CONSTRUCTION (DESIGNED)**

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	2,700,000	sf	\$4,860,000
Shot Rock/Rip Rap	9,600	lf	\$6,816,000
Sheetpile Placement	288,000	sf	\$5,472,000
Clean Soil Cap	205,000	cy	\$2,050,000
Seeding	300,000	sy	\$300,000
Mitigation	62	acre	\$619,835
Direct Capital:			\$20,117,835
Engineering, Procurement & Construction Management:			\$2,414,140
<b>Total Capital:</b>			<b>\$22,531,975</b>

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115
Total Present Worth, Longer Term O&M Costs			\$655,854
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$23,200,000</b>

### CDF CONSTRUCTION (PROPOSED)

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	4,500,000	sf	\$8,100,000
Shot Rock/Rip Rap	16,000	lf	\$11,360,000
Sheetpile Placement	480,000	sf	\$9,120,000
Clean Soil Cap	330,000	cy	\$3,300,000
Seeding	500,000	sy	\$500,000
Mitigation	103	acre	\$1,033,058

Direct Capital:	\$33,413,058
Engineering, Procurement & Construction Management:	\$4,009,567

**Total Capital: \$37,422,625**

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115

Total Present Worth, Longer Term O&M Costs \$655,854

**Total Project Capital and O&M Cost \$38,100,000**

### INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000

Direct Capital:	\$125,000
Engineering, Procurement & Construction Management:	15,000

**Total Capital: \$140,000**

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Long-term Monitoring	40	20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492

Total Present Worth, Longer Term O&M Costs \$844,263

**Total Project Capital and O&M Cost \$1,000,000**

**TOTAL COST \$131,000,000**

**ALTERNATIVE E: Dredge Sediment to SWAC, with Off-site Disposal of TSCA Material and On-site CDF**

**SEDIMENT REMOVAL (MECHANICAL DREDGING)**

Capital Items	Quantity	Units	Cost
Mobilization - Equipment and Silt Curtain	3	LS	\$249,000
Watertight Barges	4	ea	\$400,000
Offload Stockpile Area Prep.	1	LS	\$75,000
Dredging - 12 hour shifts	2,622	Day	\$15,732,000
Dredge Monitoring (Water Quality)	2,622	Day	\$2,097,600
Sediment Removal QA	2,622	Day	\$3,146,400
Offload Crane Mobilization	1	LS	\$50,000
Crane Offloading - 8 hour shifts	2,622	Day	\$7,603,800
Direct Capital:			\$29,353,800
Engineering, Procurement & Construction Management:			\$3,522,456
Contractor Overhead/Profit:			\$4,403,070
<b>Total Capital:</b>			<b>\$37,300,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	216,451	ton	\$5,411,275
Cement Purchase	10,308	ton	\$824,640
Soil Loading	216,451	ton	\$606,063
Soil Hauling	216,451	ton	\$1,014,614
Tipping Fees	216,451	ton	\$11,904,805
Direct Capital:			\$19,761,397
Engineering, Procurement & Construction Management:			2,371,368
<b>Total Capital:</b>			<b>\$22,100,000</b>

**WATER TREATMENT**

215 gpm unit, Purchase	1	LS	\$479,953
Water Treatment (Including Operator)	378,953,299	gal	\$151,581
Water Treatment QA	1,224	Day	\$244,800
Direct Capital:			\$876,334
Engineering, Procurement & Construction Management:			\$105,160
<b>Total Capital:</b>			<b>\$1,000,000</b>

**CDF CONSTRUCTION (DESIGNED)**

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	2,700,000	sf	\$4,860,000
Shot Rock/Rip Rap	9,600	lf	\$6,816,000
Sheetpile Placement	288,000	sf	\$5,472,000
Clean Soil Cap	205,000	cy	\$2,050,000
Seeding	300,000	sy	\$300,000
Mitigation	62	acre	\$619,835
Direct Capital:			\$20,117,835
Engineering, Procurement & Construction Management:			\$2,414,140
<b>Total Capital:</b>			<b>\$22,531,975</b>

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115
Total Present Worth, Longer Term O&M Costs			\$655,854
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$23,200,000</b>

### CDF CONSTRUCTION (PROPOSED)

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	4,500,000	sf	\$8,100,000
Shot Rock/Rip Rap	16,000	lf	\$11,360,000
Sheetpile Placement	480,000	sf	\$9,120,000
Clean Soil Cap	330,000	cy	\$3,300,000
Seeding	500,000	sy	\$500,000
Mitigation	103	acre	\$1,033,058

Direct Capital:	\$33,413,058
Engineering, Procurement & Construction Management:	\$4,009,567

**Total Capital: \$37,422,625**

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115

Total Present Worth, Longer Term O&M Costs \$655,854

**Total Project Capital and O&M Cost \$38,100,000**

### INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000

Direct Capital:	\$125,000
Engineering, Procurement & Construction Management:	15,000

**Total Capital: \$140,000**

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Long-term Monitoring	40	20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492

Total Present Worth, Longer Term O&M Costs \$844,263

**Total Project Capital and O&M Cost \$1,000,000**

**TOTAL COST \$122,700,000**

**ALTERNATIVE F: Cap Sediment to Maximum Extent Possible and Dredge to SWAC with Off-site Disposal of TSCA Materials and On-site CDF**

**CAPPING**

Capital Items	Quantity	Units	Cost
Mobilization/Site Prep	1	LS	\$100,000
Sand Purchase	472,564	tons	\$2,835,384
Placement - 10-hour shifts	1,688	Day	\$3,376,000
Cobble Purchase and Placement	112,515	cy	\$2,812,875
Cap Placement QA	1	LS	\$100,000
Direct Capital:			\$9,224,259
Engineering, Procurement & Construction Management:			1,106,911
Total Capital:			\$10,331,170
<b>Present Worth of Longer Term Operating Costs</b>	<b>Years</b>	<b>Annual Cost</b>	
<u>Monitoring/O&amp;M</u>			
Long-term Monitoring	40	\$30,000	\$357,738
Long-term O&M	40	\$65,000	\$775,100
Total Present Worth, Longer Term O&M Costs			\$1,132,838
<b>Total Project Capital and O&amp;M Cost</b>			<b>\$11,500,000</b>

**SEDIMENT REMOVAL (MECHANICAL DREDGING)**

Capital Items	Quantity	Units	Cost
Mobilization - Equipment and Silt Curtain	3	LS	\$249,000
Watertight Barges	4	ea	\$400,000
Offload Stockpile Area Prep.	1	LS	\$75,000
Dredging - 12 hour shifts	2,367	Day	\$14,202,000
Dredge Monitoring (Water Quality)	2,367	Day	\$1,893,600
Sediment Removal QA	2,367	Day	\$2,840,400
Offload Crane Mobilization	1	LS	\$50,000
Crane Offloading - 8 hour shifts	2,367	Day	\$6,864,300
Direct Capital:			\$26,574,300
Engineering, Procurement & Construction Management:			3,188,916
Contractor Overhead/Profit:			3,986,145
<b>Total Capital:</b>			<b>\$33,700,000</b>

**SEDIMENT DISPOSAL (OFF-SITE)**

Capital Items	Quantity	Units	Cost
Solidification	216,451	ton	\$5,411,275
Cement Purchase	10,308	ton	\$824,640
Soil Loading	216,451	ton	\$606,063
Soil Hauling	216,451	ton	\$1,014,614
Tipping Fees	216,451	ton	\$11,904,805
Direct Capital:			\$19,761,397
Engineering, Procurement & Construction Management:			2,371,368
<b>Total Capital:</b>			<b>\$22,100,000</b>

**WATER TREATMENT**

Capital Items	Quantity	Units	Cost
215 gpm unit, Purchase	1	LS	\$479,953
Water Treatment (Including Operator)	341,972,761	gal	\$136,789
Water Treatment QA	1,105	Day	\$221,000
Direct Capital:			\$837,742
Engineering, Procurement & Construction Management:			100,529
<b>Total Capital:</b>			<b>\$900,000</b>

### CDF CONSTRUCTION (DESIGNED)

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	2,700,000	sf	\$4,860,000
Shot Rock/Rip Rap	9,600	lf	\$6,816,000
Sheetpile Placement	288,000	sf	\$5,472,000
Clean Soil Cap	205,000	cy	\$2,050,000
Seeding	300,000	sy	\$300,000
Mitigation	62	acre	\$619,835

Direct Capital:	\$20,117,835
Engineering, Procurement & Construction Management:	2,414,140

**Total Capital: \$22,531,975**

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115

Total Present Worth, Longer Term O&M Costs \$655,854

**Total Project Capital and O&M Cost \$23,200,000**

### CDF CONSTRUCTION (PROPOSED)

Capital Items	Quantity	Units	Cost
Land Lease or Purchase	4,500,000	sf	\$8,100,000
Shot Rock/Rip Rap	16,000	lf	\$11,360,000
Sheetpile Placement	480,000	sf	\$9,120,000
Clean Soil Cap	330,000	cy	\$3,300,000
Seeding	500,000	sy	\$500,000
Mitigation	103	acre	\$1,033,058

Direct Capital:	\$33,413,058
Engineering, Procurement & Construction Management:	\$4,009,567

**Total Capital: \$37,422,625**

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Mitigation	40	10,000	\$119,246
Long-term Monitoring	40	20,000	\$238,492
Long-term O&M	40	25,000	\$298,115

Total Present Worth, Longer Term O&M Costs \$655,854

**Total Project Capital and O&M Cost \$38,100,000**

### INSTITUTIONAL CONTROLS

Capital Items	Quantity	Units	Cost
Public Education Program	1	LS	\$100,000
O&M Plans	1	LS	\$20,000
Deed Restrictions	1	LS	\$5,000

Direct Capital:	\$125,000
Engineering, Procurement & Construction Management:	15,000

**Total Capital: \$140,000**

Present Worth of Longer Term Operating Costs	Years	Annual Cost	
Long-term Monitoring	40	20,000	\$238,492
Public Education Program	40	30,000	\$357,738
Maintaining O&M Plans	40	800	\$9,540
Reporting	40	20,000	\$238,492

Total Present Worth, Longer Term O&M Costs \$844,263

**Total Project Capital and O&M Cost \$1,000,000**

**TOTAL COST \$130,500,000**